

PATENTS  
112025-0533  
Seq. #7287 CPOL #270924

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In Re The Application of:  
David Anthony Cook )  
Serial No.: 10/665,805 )  
Filed: September 18, 2003 )  
For: TTL EXPLORATION TECH- )  
NIQUE FOR DETERMINING )  
CAPABILITIES AND CON- )  
FIGURATION OF A PEER )  
ROUTER )

Examiner: Yemane M. Geregihir  
Art Unit: 2144

Cesari and McKenna, LLP  
88 Black Falcon Avenue  
Boston, MA 02210  
March 1, 2008

BY EFS

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

**DECLARATION UNDER 37 C.F.R. §1.131**

I, David Anthony Cook, the Applicant in the above identified patent application, declare as follows:

1. I am the inventor of the subject matter of the above-identified patent application.
2. At all relevant times I have been under an obligation to assign the above-identified patent application to Cisco Technology, Inc., whose address is 170 West Tasman Drive, San Jose, CA 95134-1706.
3. As set forth herein, the subject matter claimed in the above-identified patent application was conceived by me within the United States before Apr. 22, 2003. Further, from before Apr. 22, 2003 to Sept. 18, 2003, the filing date of the above-identified patent application, I diligently worked to reduce the invention to practice.

CONCEPTION

4. Attached hereto as Exhibit A is a true and correct redacted copy of an invention disclosure report titled "Mechanism to Determine TTL Capabilities without Negotiation." The invention disclosure report was prepared prior to Apr. 22, 2003 and demonstrates conception before that date. Dates and certain confidential information, for example, personal telephone numbers, on Exhibit A have been redacted.
5. Attention is directed to the Summary section of Exhibit A, which describes automatically determining which TTL method a peer is using, in part by sending an initial packet with a first TTL parameter. The Summary section goes on to describe that, if this message is received and acknowledged, it may be assumed that the peer supports the new TTL parameter, and if no acknowledgement is received, then session/adjacency establishment may be retried with an old TTL parameter.

REDUCTION TO PRACTICE

6. On information and belief, the invention described in the above-identified patent application, was reduced to practice no later than Sept. 18, 2003. On Sept. 18, 2003 the above-identified patent application filed with the USPTO, constructively reduced the invention to practice.

DILIGENCE

7. During the time span from prior to Apr. 22, 2003 to Sept. 18, 2003, I diligently worked to reduce the invention to practice. In part, I worked on preparing the above-captioned patent application. Specifically, I provided detailed information regarding my invention to a patent attorney, and reviewed and commented upon one or more drafts to prepare the patent application filed on Sept. 18, 2003.
8. As inventor of the identified patent application, I hereby declare that all the statements made herein, to my own knowledge, are true, and that all statements made on information and belief are believed to be true. I further declare the statements herein were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code, and that any such willful false statements may jeopardize the validity of any patent the might issues from the present application.

Name: David Anthony Cook  
Signature: David Anthony Cook  
Date: 3/31/08

## EXHIBIT A

## CISCO CONFIDENTIAL

This report contains the following 1 ideas:

Idea No.	Title	Inventors	Entered	Updated
270924	Mechanism to Determine TTL Capabilities without Negotiation	David Cook (dacook)		

Report generated:

**REDACTED**

## CISCO CONFIDENTIAL

## #270924: Mechanism to Determine TTL Capabilities without Negotiation

## Status Info

Submitted: CPOL No.: 270924 Status: In Process Type: Regular  
 Modified: Seq No.: 7287 Origin: Cisco  
**REDACTED**  
 Docket: ---  
 History: ---

## Attorney Info

## US Filing Info

## Issuance Info

Name: Barbas Filed: --- Application: No Date Issued: ---  
 Assigned: Serial No.: --- Req Non-Pub: No Patent No.: ---  
 Drafter: Assignments: No

## Full Details

## Inventors

David Cook (dacook) Manager: aretana  
 Type: Regular Dept: Core IP Eng - Routing Division: ITG  
 Phone: **REDACTED** Site: RESEARCH TRIANGL

## Background

Historically BGP transmits packets with a TTL of 1 for all directly connected peers. For all incoming BGP packets, the TTL can then be checked to ensure that it is 0. Recently, it has been accepted that it is more secure to use a TTL of 255 for transmitted BGP packets. Incoming BGP packets should then have a TTL of 254 for directly connected peers. Therefore, attacks on BGP must originate on the link that connects the peers in order to have a TTL of 254. Multihop BGP can use this same method by only accepting packets with a TTL of 253 or less corresponding to the number of hops between BGP peers. In order to use this new TTL method for BGP sessions, it must be configured on a per-peer basis. Configuring this option on potentially thousands of peering sessions is time consuming and increases the possibility of config mismatches that prevent peering sessions from being established. A method is needed to automatically detect whether a peer supports and is using this option.

## Summary

In order to automatically determine which TTL method a peer is using, the

**REDACTED**

initial packet (used to establish the session/adjacency) can first be sent with a TTL of 255. If this message is received and acknowledged, it can be assumed that the peer supports sending the new TTL. If no acknowledgement is received, then the session/adjacency establishment is retried with the normal TTL of 1 (or the number of hops in the case of BGP multihop). This method allows old and new implementations to interoperate together without extra configuration. The security benefit of sending a TTL of 255 is automatically realized if it is supported by both peers. This is a brand new problem in session/adjacency establishment that is being solved. Also, there is no previous method that uses TTL exploration to determine a peer's capability and configuration.

**Advantages**

It avoids any changes to the current protocol specification. Also, no manual configuration is necessary to realize the benefits.

**Cisco use**

This can be used on all Cisco implementations including BGP.

**Method of detecting use by other companies**

The method of sending multiple packets with different TTLs and changing behavior based on the response to determine a speaker's configuration can be detected by monitoring the packets transmitted. If another company sends the same sequence of TTLs and responds in the same way, then it can be determined that they are using the same algorithm and method.

**Previous public use**

No.

**First written record date**

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**First written record URLs**

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**Supporting docs URLs**

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**IDs to other applications**